Simulation Interoperability Standards Organization

"Simulation Interoperability & Reuse through Standards"

The Metaverse – Dead or Resting?

SIM-2024-Presentation-11

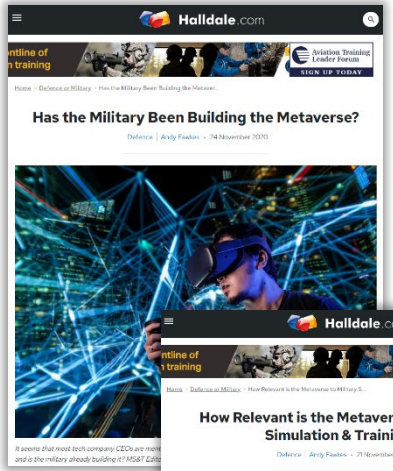
Andy Fawkes | Thinke Company | UK

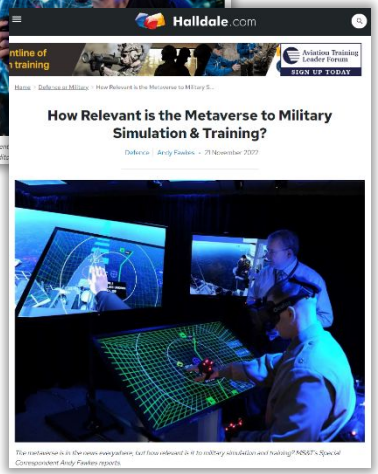
andy.fawkes@thinke.co.uk

Outline

- Background
- The Metaverse in 2024
- Metaverse Standards
- Dead?

Background


Halldale.com
Has the Military Been Building the Metaverse?
Defence | Andy Fawkes - 24 November 2020


Halldale.com
How Relevant is the Metaverse to Military Simulation & Training?
Defence | Andy Fawkes - 21 November 2021


SISO
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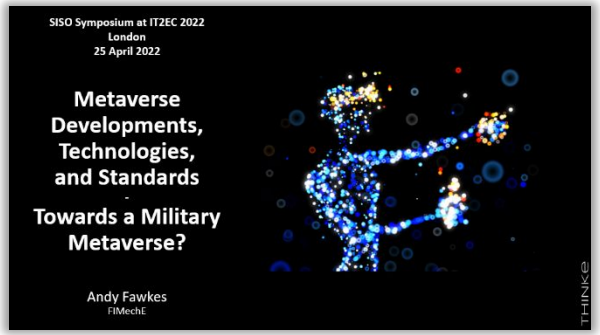
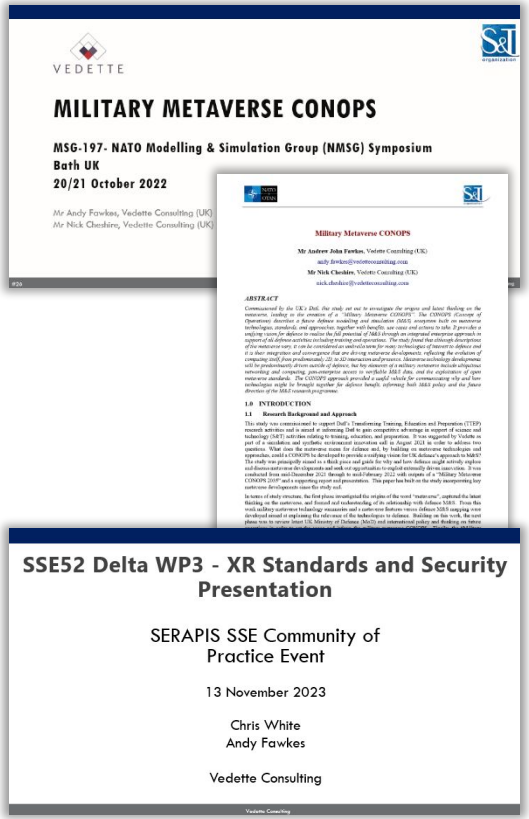
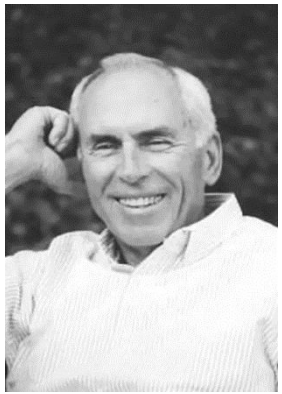
The Military's Metaverse
SIM-2021-Presentation-22 (SIMbrief)
Andy Fawkes, Thinke Company, UK
2021 SIMposium
21-22 September 2021


SISO Symposium at IT2EC 2022
London
25 April 2022
Metaverse Developments, Technologies, and Standards
-
Towards a Military Metaverse?
Andy Fawkes
FIMechE
THINKE

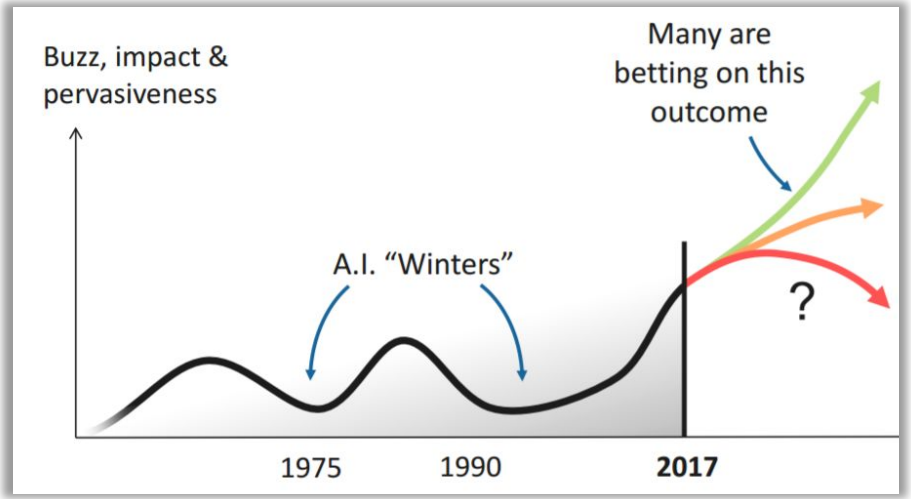

VEDETTE
MILITARY METAVERSE CONOPS
MSG-197- NATO Modelling & Simulation Group (NMSG) Symposium
Bath UK
20/21 October 2022
Mr Andy Fawkes, Vedette Consulting (UK)
Mr Nick Cheshire, Vedette Consulting (UK)
Military Metaverse CONOPS
ABSTRACT
1.0 INTRODUCTION
SSE52 Delta WP3 - XR Standards and Security Presentation
SERAPIS SSE Community of Practice Event
13 November 2023
Chris White
Andy Fawkes
Vedette Consulting

Technology Prediction …



"We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run."

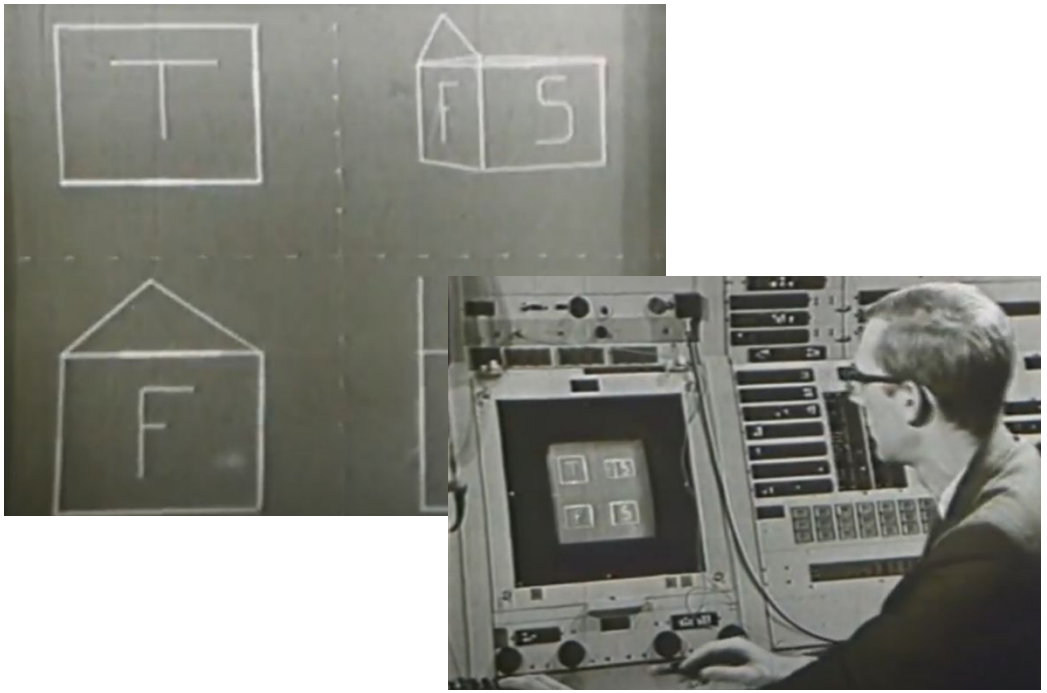
Roy Amara (1925 – 2007)
Head Stanford Institute for the Future



"AI Winters"

Early 1960s

"Spacewar!" 1962 (MIT)



Ivan Sutherland's "Sketchpad" 1963 (MIT)

Early 1960s

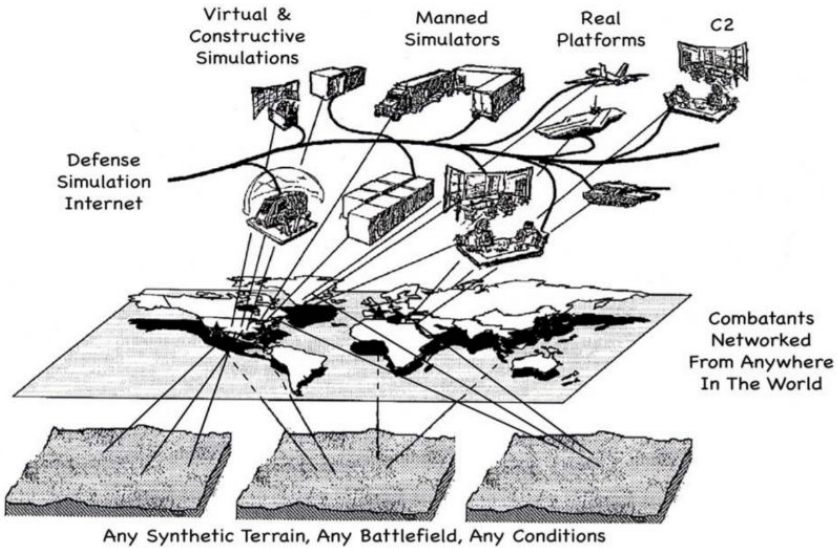
Physical World

Digital World

Early 1990s

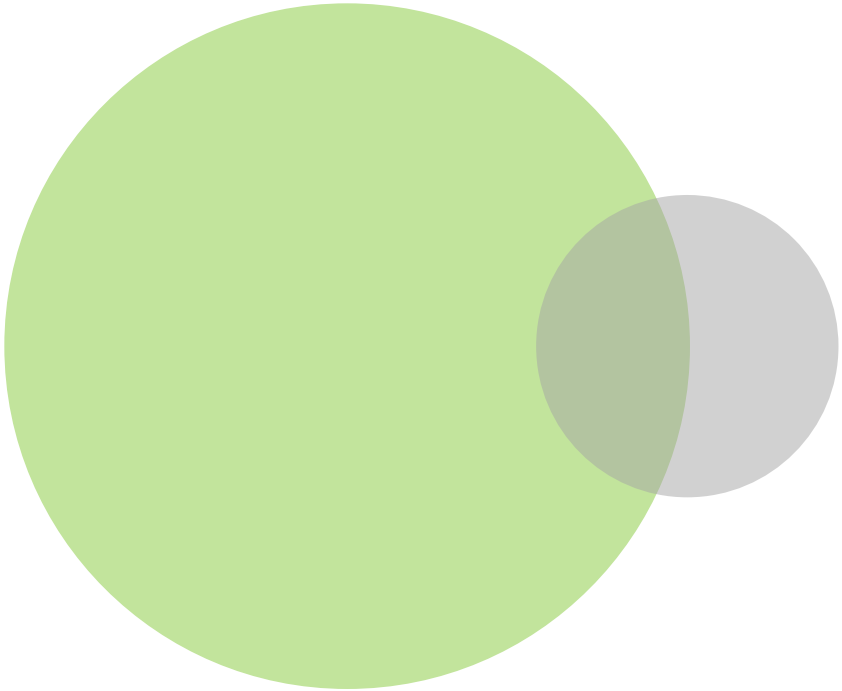
Virtuality "Dactyl Nightmare" (1991)

Multi-player VR



US DARPA/Army SIMNET

Early 1990s

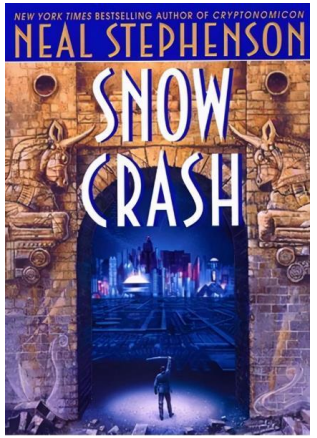


Physical World

Digital World

Enter the “Metaverse”

- Snow Crash is a 1992 science fiction novel by American writer Neal Stephenson
- Metaverse is a portmanteau of "meta" (meaning beyond) and “universe”



- The Metaverse is a collective virtual shared space, created by the convergence of virtually enhanced physical reality and physically persistent virtual space, including the sum of all virtual worlds, augmented reality, and the Internet

2024

VR car-driving simulators at Eastern Pioneer Driving School in Beijing (Reuters)

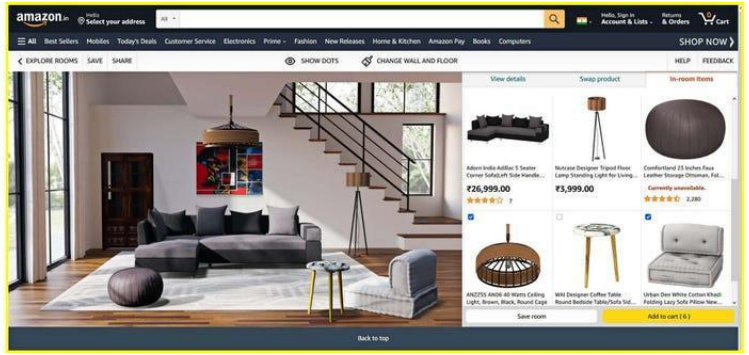
https://youtu.be/4vWuEKhE6Xc?si=EoS_9x1qEuNdIb8j

Fortnite Live Player	Users -
Online Players (1H) [?]	959,930
Active Players (30D) [?]	222,245,176
Twitch Watched Hours (30D) [?]	41,503,975
Peak Viewers (30D) [?]	216,271
Total Streamers (30D) [?]	771,580

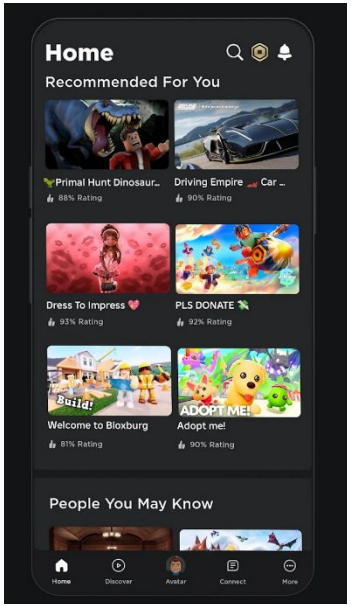
https://activeplayer.io/fortnite/

2024

Neoscape

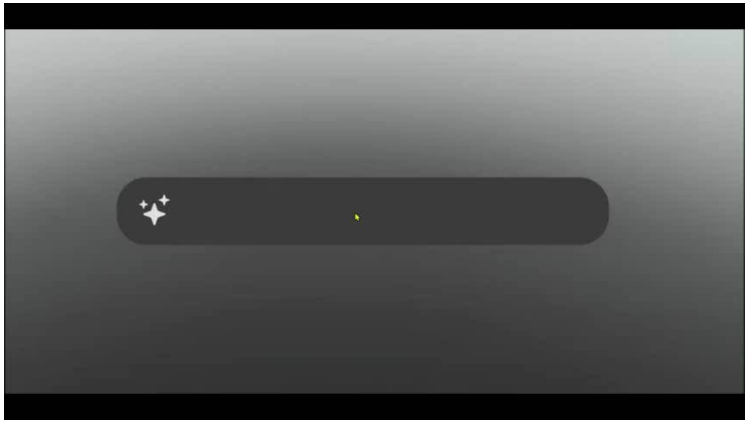


Amazon



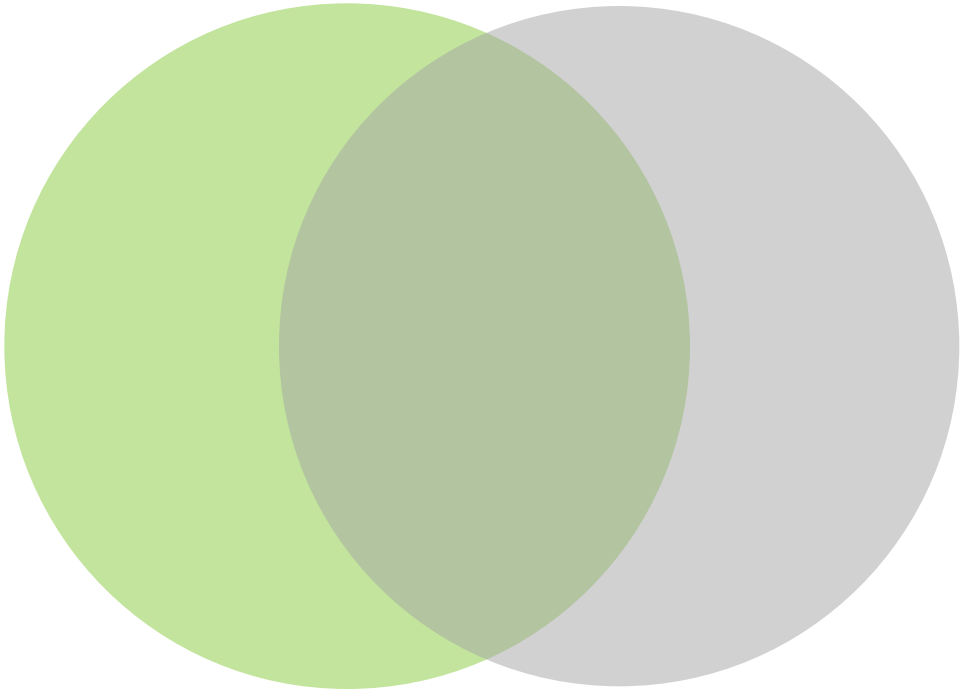
- An online platform where people play games, create experiences, and connect with others, built by a global community of creators

- Key Points (Sep 24)
  - User Growth: 79.5M daily users (58% aged 13+); 20% growth in key regions in Q2 2024
  - Future Ambition: Aiming for 1bn daily users; next goal: 300M users
  - Revenue Goal: Targeting 10% of global gaming revenue ($180B industry)
  - Creator Earnings: New earning methods include physical merchandise



Announced 6 Sept – Open source generative AI tool in development "the 3D Foundational Model"

Early 2020s?

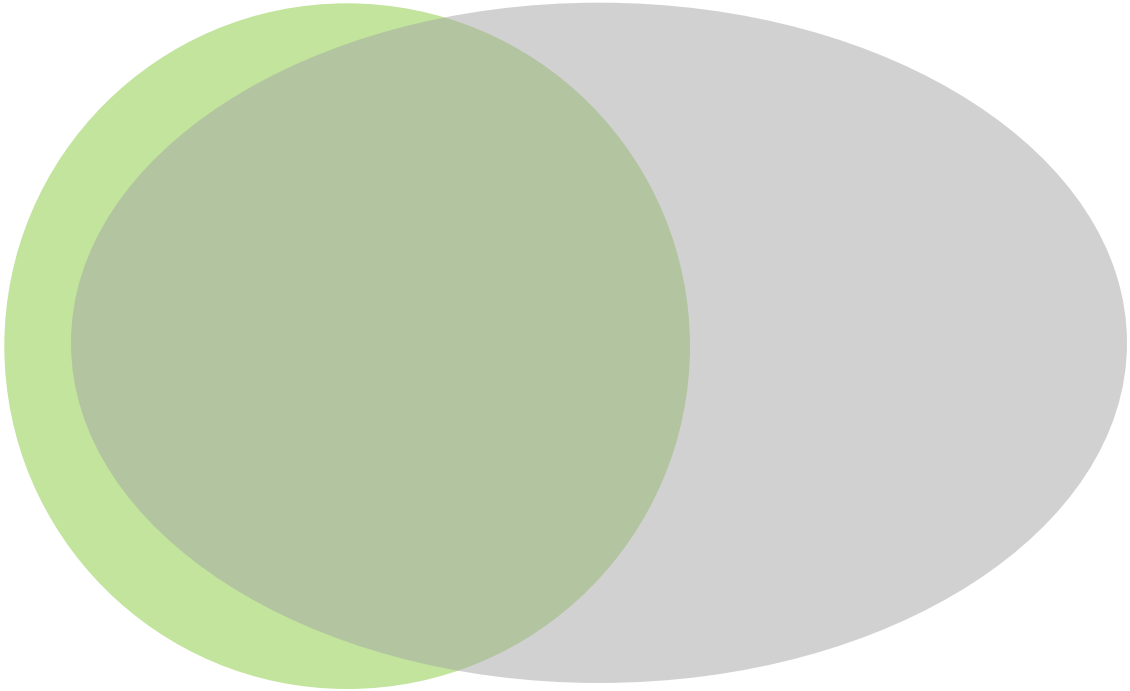


Physical/Digital World

The Digital World Trends (?)

- Ubiquitous
- Connected
- Persistent
- In the Physical World
- Immersive
- 3-Dimensional
- Intelligent
- Intuitive
- Democratised

Early 2030s - From Novelty to Necessity?



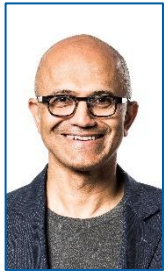
Physical/Digital World

A Little Troubling?

The Metaverse was all Over the News in 2021


Unity

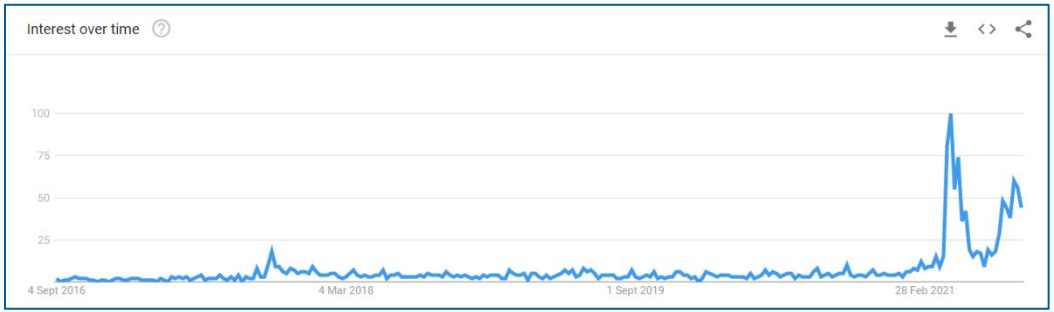
Roblox


Microsoft


Facebook

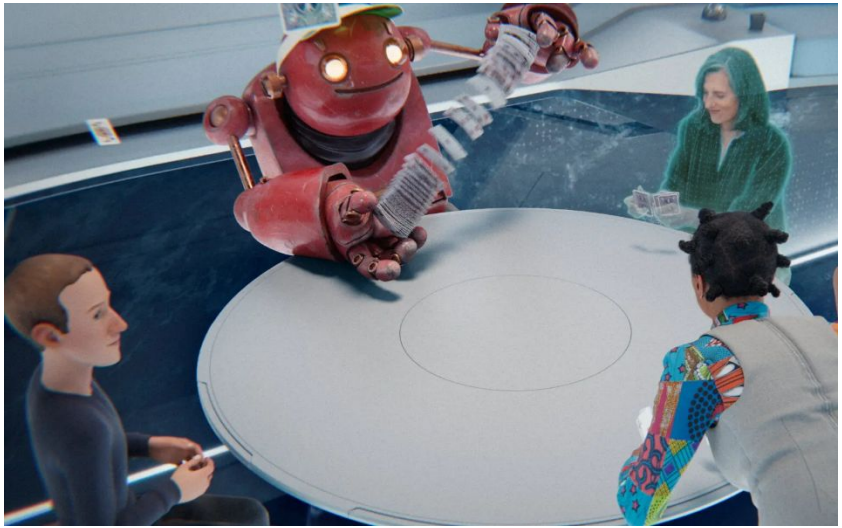

Epic Games


Nvidia



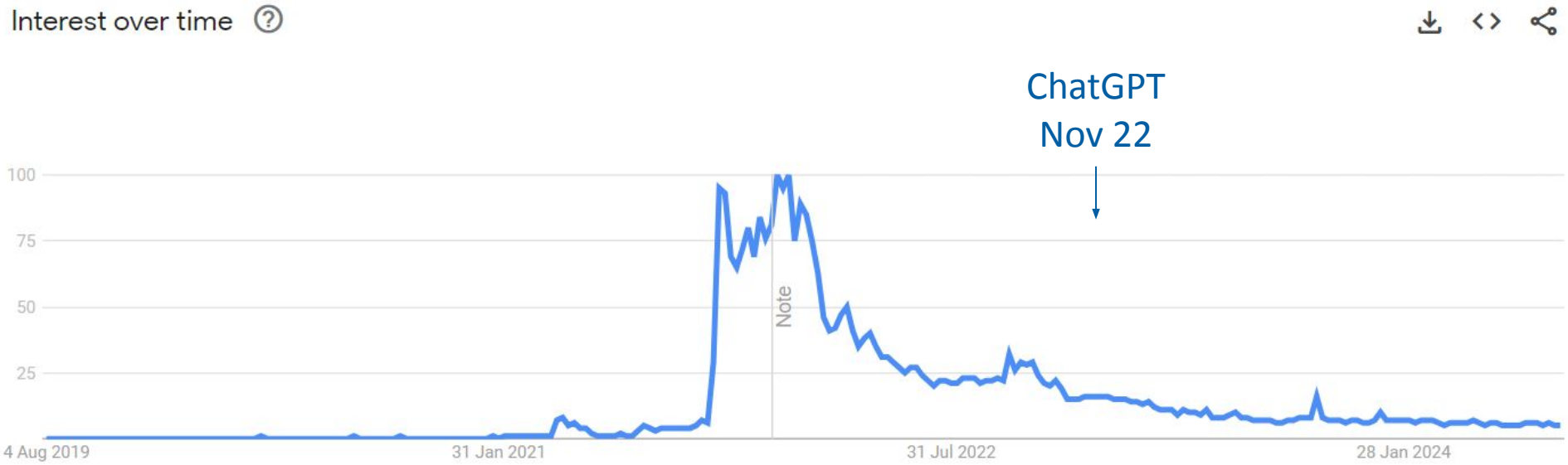
Google Word Search

Facebook to Meta – October 2021



Losing its Shine

The Death of the Metaverse



Google Trends

The Death of the Metaverse

INVESTORPLACE

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Home / Expert Stock Picks / Stocks to Sell

3 Metaverse Stocks to Sell in August Before They Crash & Burn

The metaverse is proving to be a money pit for the deeply tied to the virtual world

15h ago · By Rich Duprey, InvestorPlace Contributor

- The metaverse is proving to be more fad than trend making those that went all-in on it metaverse, stocks to sell.
- **Unity Software** (U): The gaming software engine maker was going to power the metaverse's virtual world but failed to achieve any gains or profits.
- **Roblox** (RBLX): The teen gaming platform is closely tied to the metaverse, and while still attracting users is seeing falling sales and a lack of profitability.
- **Roundhill Ball Metaverse ETF** (METV): Putting all the metaverse eggs in one basket has not worked out well for this ETF.

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LAST UPDATED: MAY 31, 2023 • IN AI MYSTERIES

5 Things That Killed The Metaverse

In less than two years since genesis, the metaverse has already met its demise. Here are five reasons why we'll never see the metaverse again.

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UK World Climate crisis Ukraine Football Newsletters Business Environment More

The Observer The metaverse

This article is more than 1 year old

A moment's silence, please, for the death of Mark Zuckerberg's metaverse

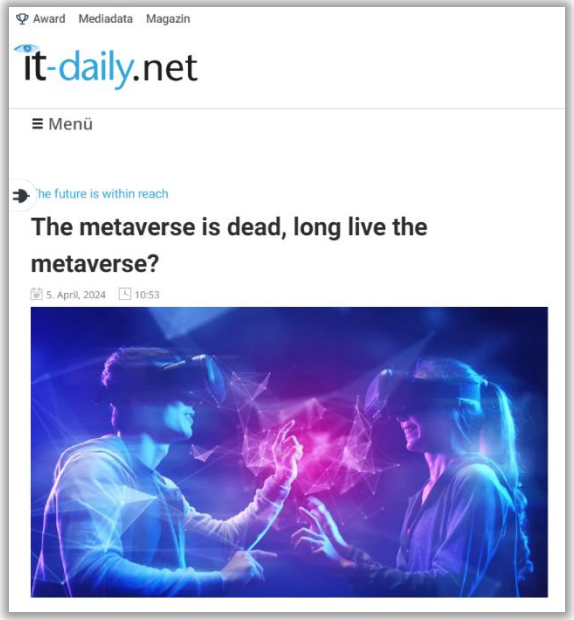
John Naughton

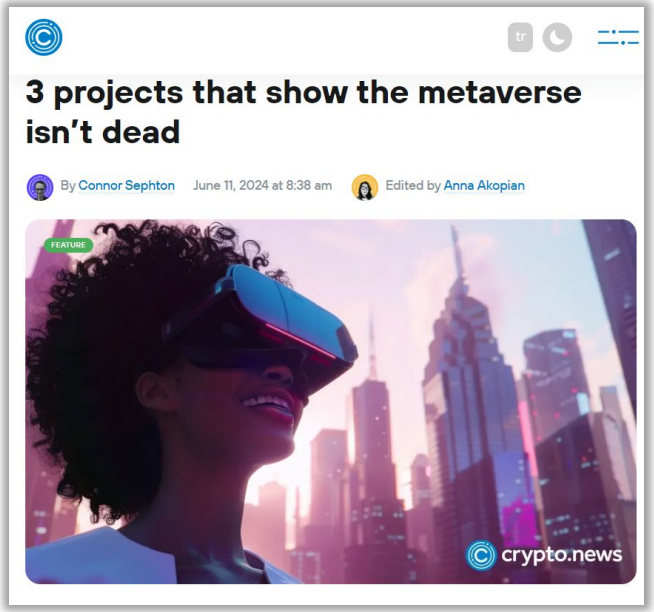
Meta sank tens of billions into its CEO's virtual reality dream, but what will he do next?

Sat 13 May 2023 16.00 BST

Share 206

The Death of the Metaverse - Maybe …





What is this Metaverse Now?

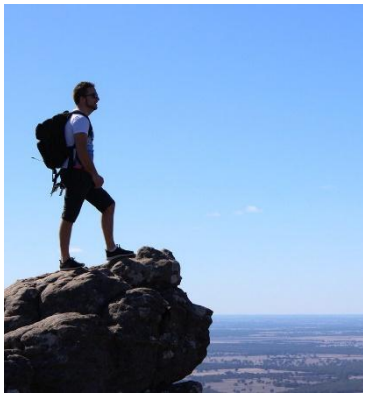
- **Spatial Computing?**
  - A technology and method focused on blending digital content with the physical world
- **Immersive Technology?**
  - Digital tools that create engaging, interactive experiences, often making users feel part of a virtual environment

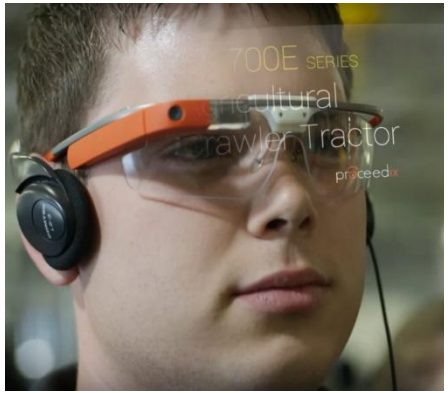
- **The Metaverse Redefined?**
  - **Persistent interactive connected digital 3D worlds for multiple uses, ranging from wholly digital to blended with the physical world, and that are factual or imagined**

- **Whatever -** The real world is three-dimensional and immersive, and increasingly the digital world will be too

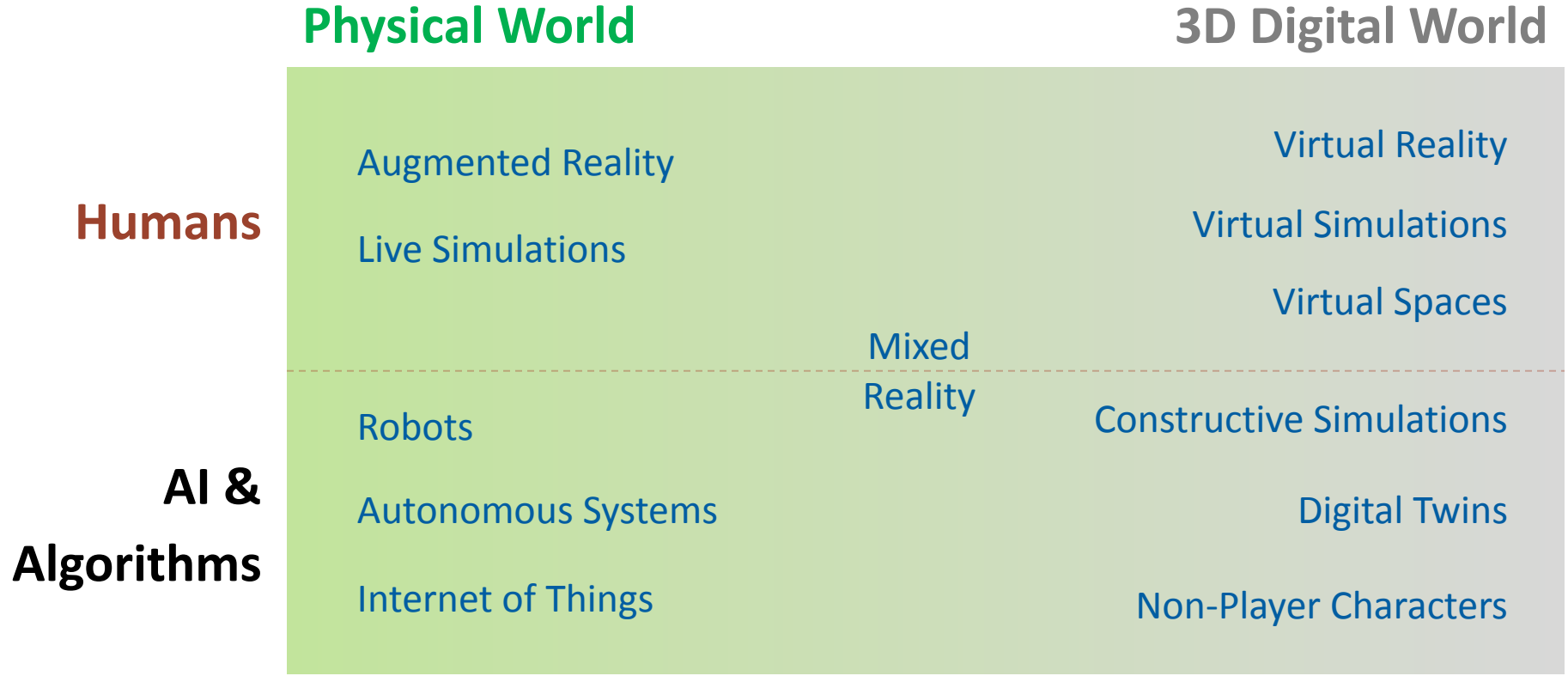
eXtended Reality (XR)

Reality	Augmented Reality	Mixed Reality	Virtual Reality
The physical world	Information layered over physical world	Blend of real & digital information	Fully virtual world





The Metaverse in 2024 – A Unifying Concept?

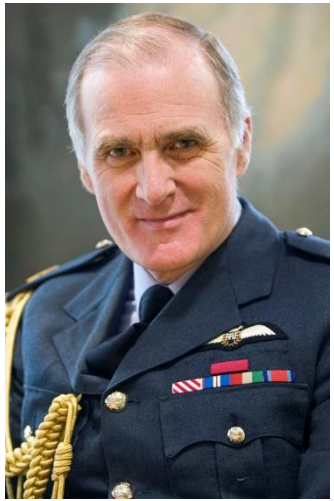


The Metaverse in the Future?

Human and AI Controlled Systems Coexisting in Mixed Physical and 3D Digital Realities

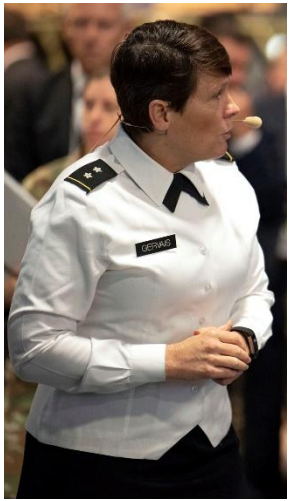
The Military (LVC) Metaverse Vision?

Top Cover for the Military Metaverse



UK Chief of
Defence Staff
Sir Jock Stirrup
2007

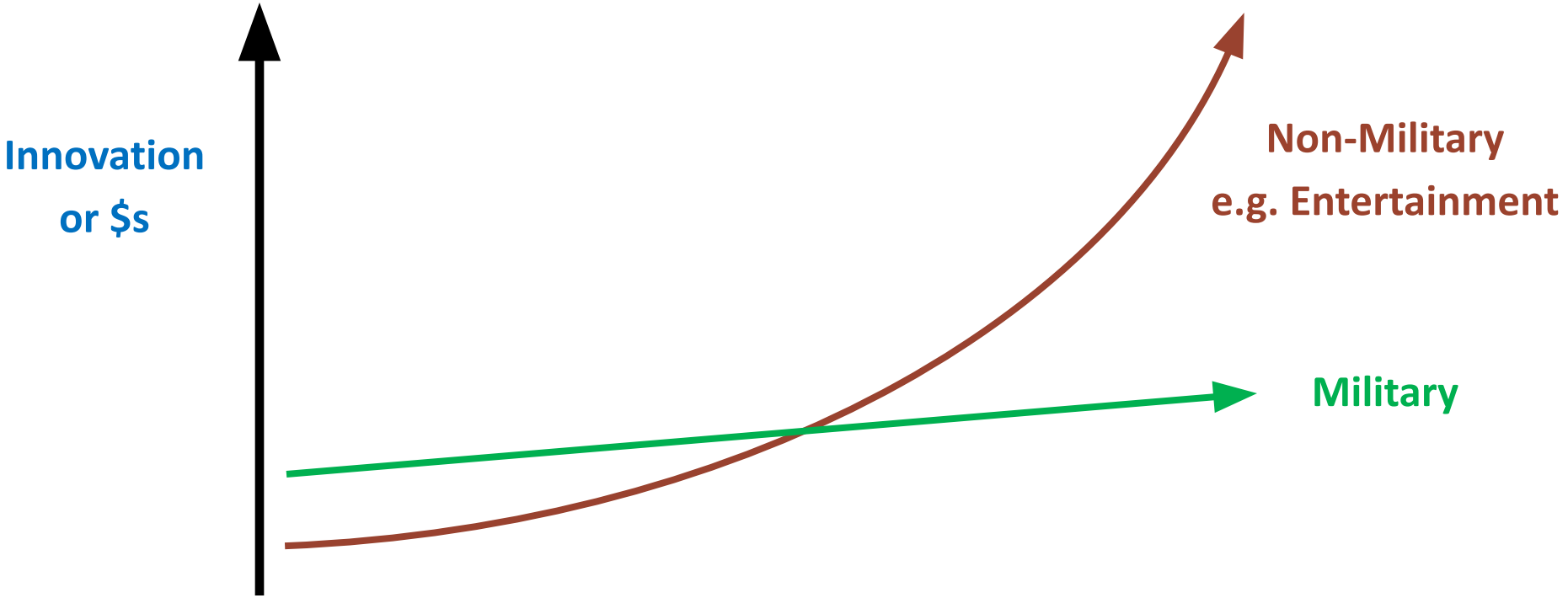
… and we can see emerging the fusing of synthetic and real world environments such that it would make increasingly difficult to distinguish between training carried out in simulation and the real thing



US Army
MG Maria Gervais
2020

our goal is … where live, virtual and constructive training can be converged through common standards, common data, common terrain and an open architecture

Who is Driving Metaverse Technologies?

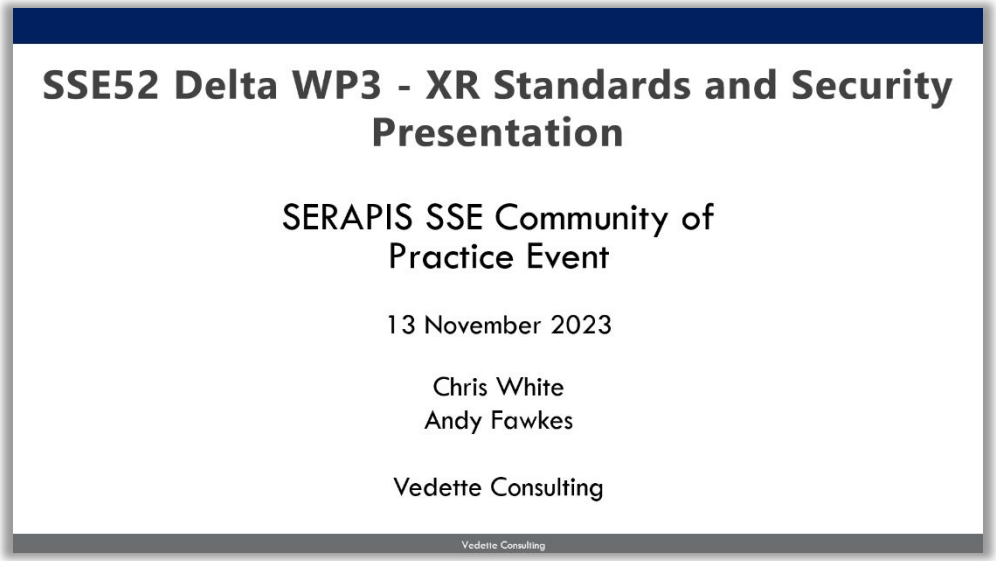


A Metaverse for the Military?

- Defence used to own the technology futures
- Commercial decisions now drive technology
- It's a unifying concept

- Options:
  - "Do Nothing"?
  - Monitor, Create and Exploit Standards?
  - Establish Foundational Secure Infrastructure and Services?
  - Buy an Innovation Pipeline?

Influences …


SSE52 Delta WP3 - XR Standards and Security Presentation

SERAPIS SSE Community of Practice Event

13 November 2023

Chris White
Andy Fawkes

Vedette Consulting

Vedette Consulting

Developed standards & security recommendations for future MoD training policy that will help ensure effective use of XR for learning

Some Organisations Developing & Supporting Metaverse Standards

1. **Khronos Group:**
   1. **Role:** An industry consortium that creates open standards for graphics, compute, vision, and audio. Khronos is responsible for important standards like OpenXR and glTF, which are foundational for spatial computing and the metaverse.
   2. **Impact:** Khronos Group standards are widely adopted in the industry, ensuring interoperability across different hardware and software platforms.
2. **World Wide Web Consortium (W3C):**
   1. **Role:** The main international standards organization for the World Wide Web, the W3C is involved in developing standards like Decentralized Identifiers (DIDs) and WebRTC, which are crucial for the metaverse.
   2. **Impact:** W3C's standards ensure that web-based metaverse applications are open, accessible, and interoperable.
3. **Open Geospatial Consortium (OGC):**
   1. **Role:** An organization that develops open standards for geospatial and location-based services, which are critical for spatial computing applications that involve mapping and real-world data.
   2. **Impact:** OGC standards support the integration of spatial data and services across different platforms and applications, enabling accurate and reliable geospatial computing.
4. **IEEE (Institute of Electrical and Electronics Engineers):**
   1. **Role:** A major standards organization that develops and maintains a wide range of standards, including those related to VR, AR, and IoT (Internet of Things), all of which are essential for spatial computing and the metaverse.
   2. **Impact:** IEEE standards help ensure that the underlying technologies for the metaverse and spatial computing are robust, scalable, and interoperable.
5. **Metaverse Standards Forum:**
   1. **Role:** A collaborative initiative launched in 2022 to foster interoperability standards for an open and inclusive metaverse. It includes a broad coalition of companies and organizations, such as Meta, Microsoft, and NVIDIA.
   2. **Impact:** This forum brings together diverse stakeholders to address the challenges of interoperability and establish a common framework for building the metaverse.
6. **ISO (International Organization for Standardization):**
   1. **Role:** An independent, non-governmental international organization that develops standards across various industries, including those relevant to spatial computing and the metaverse.
   2. **Impact:** ISO standards provide global benchmarks for quality, safety, and efficiency, ensuring that technologies within the metaverse and spatial computing domains are reliable and secure.

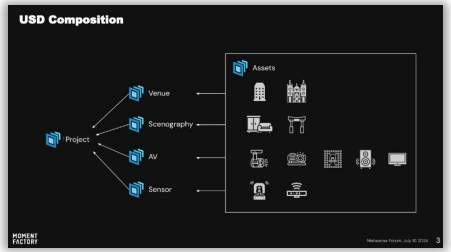
Metaverse Standards Forum (Current Activity)

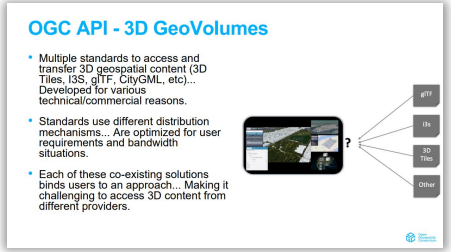
Recent sub-group attendance

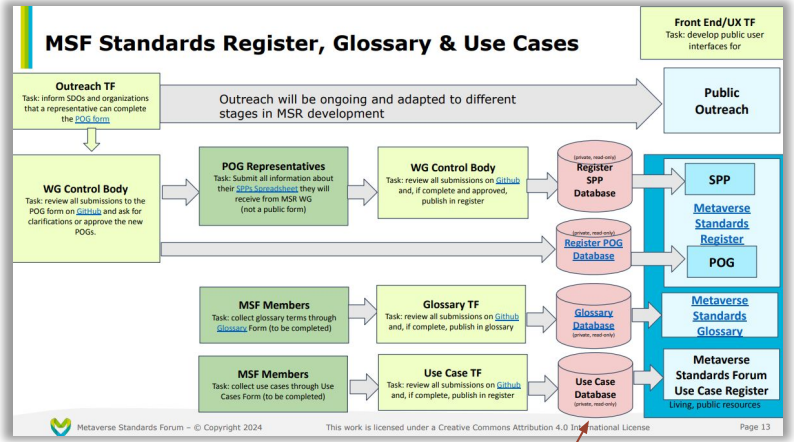
- **3D Asset Interoperability Meeting**
- **Wednesday, 24 July at 11am PT**

- Autodesk, Inc.
- British Broadcasting Corporation
- Cesium
- Fora Ante
- Genies Inc.
- Genomics Personalized Health (GPH)
- Hkdolts
- Kengin Games
- Khronos Group, Inc.
- Moment Factory
- National Institute of Standards and Technology
- NVIDIA
- OTOY Inc.
- Portable Kingdom Limited
- Priscilla Angelique
- SimBlocks.io
- SumSet Tech
- Target Corporation
- Walt Disney Company
- XR Goods Company
- 3KEN

Briefings







Use Cases ⇄ Standards

Military Metaverse Standards Framework

Theme	Sub-Themes	Example Standards
3D Content	Objects, Materials, Rendering	glTF, OpenUSD, OpenPBR, MaterialX, OpenFlight, Digital Twins
3D Worlds	Geospatial, Human-Built, Biomes	CDB, CityGML, 3D Tiles, BIM, ISO 19107, OGC API - 3D GeoVolumes
Sim-Sim Interoperability	Models, Comms	HLA, DIS, DSEEP, SpaceFOM, TENA
Sim-Others Interoperability	Software, Hardware	Cyber DEM, C2-SIM, CIGI, UCATT, Link 11/16, WebLVC, OpenXR, WebXR
Networking	Performance, Wireless, Security	5G/6G, WiFi 7, ISO/IEC 27033
User Experience	Safety, UX, Performance Tracking	ISO 45001, ISO/IEC 5927:2024, ISO 25010, xAPI, Caliper Analytics, LTI
Governance	Security, VV&A, Privacy, Ethics	ISO/IEC 27001, IEEE 1012, ISO/IEC 27701, GDPR, IEEE 7000

Military Simulation Enterprise ~~Metaverse~~ Standards Framework

Theme	Sub-Themes	Example Standards
3D Content	Objects, Materials, Rendering	glTF, OpenUSD, OpenPBR, MaterialX, OpenFlight, Digital Twins
3D Worlds	Geospatial, Human-Built, Biomes	CDB, CityGML, 3D Tiles, BIM, ISO 19107, OGC API - 3D GeoVolumes
Sim-Sim Interoperability	Models, Comms	HLA, DIS, DSEEP, SpaceFOM, TENA
Sim-Others Interoperability	Software, Hardware	Cyber DEM, C2-SIM, CIGI, UCATT, Link 11/16, WebLVC, OpenXR, WebXR
Networking	Performance, Wireless, Security	5G/6G, WiFi 7, ISO/IEC 27033
User Experience	Safety, UX, Performance Tracking	ISO 45001, ISO/IEC 5927:2024, ISO 25010, xAPI, Caliper Analytics, LTI
Governance	Security, VV&A, Privacy, Ethics	ISO/IEC 27001, IEEE 1012, ISO/IEC 27701, GDPR, IEEE 7000

Unifying 10 Key ~~Metaverse~~ Technology Trends

- 3D Graphics and Modeling
- 5G and Future Networks
- Artificial Intelligence (AI)
- Blockchain
- Cloud Computing
- Digital Twins
- eXtended Reality (XR)
- Interoperability Standards
- Sensors
- Spatial Computing

Unifying the Trends

The Metaverse is Resting and will Rise Again

- The Metaverse may be resting but its foundational technologies are alive and very well
- Whether it is called the metaverse or not, we need a unifying concept for the rapid advances in the interactive 3D digital domain if their full potential is to be realised
- This is an opportunity to minimise incompatibility, stovepipes, and poor multi-domain interoperability, and embrace wider non-defence trends
- A Military Metaverse Standards Framework is a Starting Point, and builds on significant standards activity elsewhere

Simulation Interoperability Standards Organization

"Simulation Interoperability & Reuse through Standards"

QUESTIONS